ISTEP+ Grades 7 and 8 Mathematics Reference Sheet

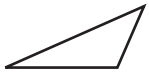
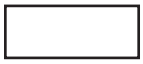
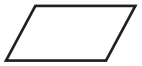
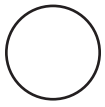
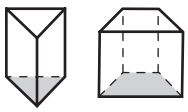
Shape	Formulas for Area (A) and Circumference (C)
Triangle 	$A = \frac{1}{2}bh = \frac{1}{2} \times$ base $\times$ height
Rectangle 	$A = lw =$ length $\times$ width
Trapezoid	$A = \frac{1}{2}(b_1 + b_2)h = \frac{1}{2} \times$ sum of bases $\times$ height
Parallelogram 	$A = bh =$ base $\times$ height
Square	$A = s^2 =$ side $\times$ side
Circle 	$A = \pi r^2 = \pi \times$ square of radius $C = 2\pi r = 2 \times \pi \times$ radius $\pi \approx 3.14$ or $\frac{22}{7}$

Figure	Formulas for Volume (V) and Surface Area (SA)
Rectangular Prism	$V = lwh =$ length $\times$ width $\times$ height $SA = 2lw + 2hw + 2lh$ $=$ 2(length $\times$ width) + 2(height $\times$ width) + 2(length $\times$ height)
General Prisms 	$V = Bh =$ area of base $\times$ height $SA =$ sum of the areas of the faces
Cylinder	$V = \pi r^2 h = \pi \times$ square of radius $\times$ height $SA = 2\pi r^2 + 2\pi rh$ $= 2 \times \pi \times$ square of radius $+ 2 \times \pi \times$ radius $\times$ height $\pi \approx 3.14$ or $\frac{22}{7}$

Conversions

1 yard = 3 feet = 36 inches
1 mile = 1,760 yards = 5,280 feet
1 acre = 43,560 square feet
1 hour = 60 minutes
1 minute = 60 seconds

1 cup = 8 fluid ounces
1 pint = 2 cups
1 quart = 2 pints
1 gallon = 4 quarts

1 liter = 1000 milliliters = 1000 cubic centimeters
1 meter = 100 centimeters = 1000 millimeters
1 kilometer = 1000 meters
1 gram = 1000 milligrams
1 kilogram = 1000 grams

1 pound = 16 ounces
1 ton = 2,000 pounds

Equation of a Line

Slope-Intercept Form:

$y = mx + b$

where m = slope and b = y-intercept

Slope of a Line

Let (x_1, y_1) and (x_2, y_2) be two points in the plane.

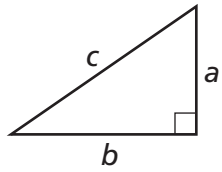
$$\text{slope} = \frac{\text{change in } y}{\text{change in } x} = \frac{y_2 - y_1}{x_2 - x_1} \text{ where } x_2 \neq x_1$$

Distance Formula

$$d = rt$$

distance = rate $\times$ time

Pythagorean Theorem



$$a^2 + b^2 = c^2$$

Temperature Formulas

$$^\circ\text{C} = \frac{5}{9}(\text{F} - 32)$$

$$^\circ\text{Celsius} = \frac{5}{9} \times (^\circ\text{Fahrenheit} - 32)$$

$$^\circ\text{F} = \frac{9}{5}\text{C} + 32$$

$$^\circ\text{Fahrenheit} = \frac{9}{5} \times {}^\circ\text{Celsius} + 32$$